

## SYLLABUS AND LESSON PLAN: GRADUATE COURSE ON INFORMATION WORK

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The syllabus and lesson plan that follow outline a 10-week course for masters-level students interested in studying information work. With some changes in the reading assignments and exercises, these materials might also facilitate an advanced undergraduate seminar or a doctoral seminar. The syllabus and lesson plan provide the foundation for description and analysis of ten major topics associated with information work; they do not facilitate the development of skills necessary to be an information worker. Few, if any, of the topics herein are dependent on topics that precede them. Thus, instructors may select among these topics or change the order of topics with little disruption to content. The materials come with no claim of completeness; the topics presented here, however, are representative of important aspects of information work.

### WEEK 1: DEFINITIONS, STATISTICS, INFORMATION SOCIETY

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This first week of class will present an overview of the material about information work and information workers. It will focus on basic definitions of what is an information society, information industry, information firm, information work, and information worker. It will also present a statistical overview that accompanies these definitions, as well as identify the difficulties in gathering useful data.

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#### LEARNING OBJECTIVES

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1. To understand the meaning of the terms information society, information industry, information firm, information work, and information worker.
2. To understand how to think about who is and who is not an information worker and how the concept of an information worker relates to the concept of a knowledge worker.
3. To understand the basic data about the number of information workers of various types and the challenges of obtaining good data.

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#### ASSIGNED READINGS

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Webster, F. (2014). Definitions. In F. Webster, *Theories of the Information Society* (pp. 10-24). New York: Routledge. This chapter gives an overview of what an information society is and how to craft a definition from various perspectives such as social or economic.

Cortada, J. (2016). A framework for understanding information ecosystems in firms and

industries. *Information & Culture*, 51(2), 133-163. This article provides a way of thinking about information industries and firms.

National Research Council. (2001). Understanding the IT workforce. In Nation Research Council, *Building a Workforce for the Information Economy* (pp. 44-91). Washington, DC: National Academies Press.

Reinhardt, W., Schmidt, B., Sloep, P., & Drachsler, H. (2011). Knowledge worker roles and actions – Results of two empirical studies. *Knowledge and Process Management*, 18(3), 150–174.

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### SUPPLEMENTAL READINGS

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#### **On theories about what is an information society**

The remaining chapters of Webster's *Theories of the Information Society*

Beniger, J. (1986). *The Control Revolution: Technological and Economic Origins of the Information Society*. Cambridge, MA: Harvard University Press.

Castells, M. (2011). *The Rise of the Network Society: The Information Age: Economy, Society, and Culture* (Vol. 1, 2<sup>nd</sup> ed.). Malden, MA: John Wiley & Sons.

Castells, M. (2011). *The Power of Identity: The Information Age: Economy, Society, and Culture* (Vol. 2, 2<sup>nd</sup> ed.). Malden, MA: John Wiley & Sons.

Castells, M. (2010). *End of Millennium: The Information Age: Economy, Society, and Culture* (Vol. 3, 2<sup>nd</sup> ed.). Malden, MA: John Wiley & Sons.

Graham, M., & Dutton, W. H. (Eds.). (2014). *Society and the Internet: How Networks of Information and Communication are Changing our Lives*. Oxford: Oxford University Press.

Chandler, A. D., & Cortada, J. W. (Eds.). (2000). *A Nation Transformed by Information: How Information has Shaped the United States From Colonial Times to the Present*. Oxford: Oxford University Press.

Oleson, A., & Voss, J. (1979). *The Organization of Knowledge in Modern America, 1860-1920*. Baltimore: Johns Hopkins University Press.

May, C. (2002). *The Information Society: A Skeptical View*. Malden, MA: Polity Press.

#### **On the notion of information industries and firms**

Cortada, J. W. (2016). A framework for understanding information ecosystems in firms and industries. *Information & Culture*, 51(2), 133-163.

Cortada, J. W. (2011). *Information and the Modern Corporation*. Cambridge, MA: MIT Press.

Cortada, J. W. (2003). *The Digital Hand: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries: How Computers Changed the Work of American Manufacturing, Transportation, and Retail Industries*. Oxford: Oxford University Press.

Cortada, J. W. (2005). *The Digital Hand: Volume II: How Computers Changed the Work of American Financial, Telecommunications, Media, and Entertainment Industries*. Oxford: Oxford University Press.

Cortada, J. W. (2008). *The Digital Hand: Volume III: How Computers Changed the Work of American Public Sector Industries*. Oxford: Oxford University Press.

Bud-Frierman, L. (1994). *Information Acumen: The Understanding and Use of Knowledge in Modern Business*. Andover, UK: Cengage Learning EMEA.

Blackler, F. (1995). Knowledge, knowledge work and organizations: An overview and interpretation. *Organization studies*, 16(6), 1021-1046.

### **On the economics of information industries, societies, and work**

Gilder, G. (2013). *Knowledge and Power: The Information Theory of Capitalism and how it is Revolutionizing our World*. Washington, DC: Regnery Publishing.

Foray, D. (2004). *Economics of Knowledge*. Cambridge, MA: MIT press.

Davenport, T. H., & Prusak, L. (1997). *Information Ecology: Mastering the Information and Knowledge Environment*. Oxford: Oxford University Press.

Neef, D. (Ed.). (1997). *The Knowledge Economy*. Boston: Butterworth-Heinemann.

Neef, D., Siesfeld, G. A., & Cefola, J. (Eds.). (1998). *The Economic Impact of Knowledge*. Boston: Butterworth-Heinemann.

Levy, F., & Murnane, R. J. (2004). *The New Division of Labor: How Computers are Creating the Next Job Market*. Princeton: Princeton University Press.

Carnoy, M. (2002). *Sustaining the New Economy: Work, Family, and Community in the Information Age*. Cambridge, MA: Harvard University Press.

### **On the notion of an information worker and a knowledge worker**

Cortada, J. (2009). *Rise of the knowledge worker*. New York: Routledge. See for an historical introduction.

National Research Council. (2001). *Building a Workforce for the Information Economy*. Washington, D.C: National Academy Press. See for a slightly dated but still very useful snapshot of what is an information worker.

Freeman, P., & Aspray, W. (1999). *The Supply of Information Technology Workers in the United States*. Washington, D.C: Computing Research Association. Also dated but still useful, especially as a companion to the NRC book and especially for IT workers rather than all information workers.

Pyöriä, P. (2005). The concept of knowledge work revisited. *Journal of Knowledge Management*, 9(3), 116-127.

Mosco, V.; McKercher, C. (2007). Introduction: theorizing knowledge labor and the information society. In C. McKercher & V. Mosco (Eds.), *Knowledge Workers in the Information Society* (pp. vii–xxiv). Lanham, MD: Lexington Books.

Drucker, P.F. (1999). *Management Challenges for the 21st Century*. New York: Harper Collins.

Sheridan, W. (2008). *How to Think Like a Knowledge Worker*. New York: United Nations Public Administration Network.

### **On statistical information**

See the Bureau of Labor Statistics, *Occupational Outlook Handbook* for job statistics; and the National Center for Education Statistics for educational statistics. The Computing Research Association Taulbee Survey provides useful data about computer science, computer engineering, and information studies.

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## EXAMPLES OF EXERCISES

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Exercise 1: John McLaughlin and Ann Birenyi (Harvard, Information Policy Research Group, 1979) created a map for information businesses that can be used to take a snapshot of the information businesses that exist at a given point in time. This mapping process can be used in additional ways. For example, one could color the portion of the map that is subject to government regulation (e.g. through the Federal Communication Commission or trade export laws) and the part that is free market; or one could track the changes in a particular company such as IBM or Microsoft by creating a collection of maps of their product and service offerings at different times.

The map is a rectangular box. A single point in the box represents individual businesses such as Internet service provider or chip manufacturer. Businesses that are more product oriented appear higher in the box; businesses that are more service oriented appear lower in the box. Businesses with both a product and a service element, e.g. the manufacture of a particular software package and its customization for a particular client, are located somewhere between the top and bottom of the box – exactly where depending on whether more of the business is about product or service. Businesses that are more about content, e.g. consulting services, would be placed toward the right side of the box. Businesses that are more about conduit, e.g. Internet service providers or makers of filing cabinets, would be placed toward the left side of the box. Businesses that

involved both a conduit and a content element would be placed somewhere in between, depending on how much of the business was about conduit and how much about content.

The exercise for students is to identify a set of information businesses that exist today and place them in the box.

Exercise 2: The cover of Peter Freeman and William Aspray, *The Supply of IT Workers in the United States* (Computing Research Association, 1999) provides a box that graphs the various information occupations. Each occupation is represented by a dot. The further to the right in the box, the more IT knowledge is required to do that job. So, for example, a professor of computer science or the head of IT services, would be placed further to the right than, say, someone who used a computer to enter business records. The more application domain knowledge is needed for the occupation, the higher the occupation appears on the chart. Jobs near the lower left corner are likely to be low-skill jobs. Jobs near the upper-right corner are likely to be high-skill jobs that require both IT savvy and knowledge of the company and the industry that it is in (e.g. chief financial officer of a manufacturing firm). If one runs a diagonal from the lower left to the upper right corner, one divides the box into two parts. The Freeman-Aspray study calls any occupation that falls to the right of that diagonal information occupations.

The exercise for students is to identify a set of information jobs that exist today and place them in the box.

## WEEK 2: OCCUPATION TRENDS, RACE, CLASS, AND GENDER

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This week of the class will begin with what kinds of changes—such as new occupations and increasingly informed existing occupations—exist in work as a result of a turn toward information. From there, it will examine the effect that a shift toward information work has had on the composition and distribution (e.g., racial, gender, geographic) of the workforce over the past half-century. The goal will be to start to think about questions such as (1) What factors have traditionally shaped the demographics of work in various occupations in the U.S.?, and (2) What kind of interplay do we see between the factors in (1) that traditionally shaped who did what work and the shift over time toward information work? It will seek answers to questions involving specific demographic factors, such as (3) In what ways and to what extent is the shift to information work changing the class structure of the U.S. workforce?, (4) Has the shift to information work improved or worsened racial diversity in the workforce and the prospects of minority workers?, and (5) What about gender diversity and female workers' prospects? Finally, shifting attention from changes that have happened in informed to work to changes that may occur in the face of increasing automation and robotics, it will also explore (7) To what extent will all humans lose their jobs to machines, and do we expect to see differences by occupation (and hence by race, class, and gender) in this loss? The students will learn how they might begin to explore these questions using publicly available U.S. occupational data, and how scholars have begun to address them using a variety of research approaches.

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## LEARNING OBJECTIVES

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1. To understand occupational, work, and workforce changes that have come about in the wake of increasing information in work. This background should serve students well in thinking about future changes in work with advances in information technologies.
2. To gain familiarity with and skills in using large federal databases of occupational data.

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## ASSIGNED READINGS

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- Catanzarite, L. (2003). Race-gender composition and occupational pay degradation. *Social Problems*, 50(1), 14-37.
- McBrier, D. B., & Wilson, G. (2004). Going down? Race and downward occupational mobility for white-collar workers in the 1990s. *Work and Occupations*, 31(3), 283-322.
- National Research Council Staff. (1999). *The Changing Nature of Work: Implications for Occupational Analysis*. Washington, D.C: National Academy Press
- Zuboff, S. (1996). The emperor's new information economy. In W. Orlikowski, G. Walsham, M. Jones, & J. DeGross (Eds.), *Information Technology and Changes in Organizational Work* (pp. 13-17). London: Chapman & Hall.

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## SUPPLEMENTAL READINGS

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- Bigler, R. S., Averhart, C. J., & Liben, L. S. (2003). Race and the workforce: occupational status, aspirations, and stereotyping among African American children. *Developmental Psychology*, 39(3), 572-580.
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: WW Norton & Company.
- Cohoon, J. M. G., & Aspray, W. (2006). *Women and Information Technology: Research on Underrepresentation*. Cambridge, MA: MIT Press.
- Levy, F., & Murnane, R. J. (2012). *The New Division of Labor: How Computers are Creating the Next Job Market*. Princeton: Princeton University Press.
- Moss, P., & Tilly, C. (1996). "Soft" skills and race: An investigation of black men's employment problems. *Work and Occupations*, 23(3), 252-276.
- Zuboff, S. (1988). *In the Age of the Smart Machine: The Future of Work and Power*. New York: Basic Books.

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## EXAMPLES OF EXERCISES

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Exercise 1: Have students use the American FactFinder tool on the census.gov page to look up their city and compare male versus female employment in a number of popular occupations in that city. Aim the discussion at how the information quotient of the occupation may shape the results, and what other factors may be at play that complicate the findings.

Exercise 2: Have students enter queries and build reports on the BLS site, the O\*NET site, or both to look at changes over time, and by demographic factors for a selection of occupations. These occupations might include ones that have remained immune to information shifts (e.g., construction laborers), ones that have become informed to some degree but retain a high physical content (e.g., auto mechanics), ones that were previously physical but have become highly informed (e.g., paper goods machine setters), and ones that were not previously physical and have become highly informed and automated (e.g., travel agents and tax preparers). Discuss each occupation in terms of barriers to employment before work became informed and after, plus predictions for how the occupation is likely to change with advances in IT such as computation and increasing digitization.

### **Possible Links for Exercises**

<http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>  
Austin workforce breakdown by gender

<http://www.bls.gov/OOH/construction-and-extraction/construction-laborers-and-helpers.htm>

<http://www.bls.gov/OOH/installation-maintenance-and-repair/automotive-service-technicians-and-mechanics.htm>

<http://www.bls.gov/oes/current/oes519196.htm> (Paper goods machine setters)

<http://www.bls.gov/OOH/sales/travel-agents.htm>

<http://www.bls.gov/oes/current/oes132082.htm> (Tax preparers)

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## WEEK 3: DATA WORK

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This week of class will examine data work as part of the course's landscape of information work and workers. While recognizing that broader management and leadership principles structure particular instances of data work in organizations, this week focuses on the pragmatics of producing, curating, and analyzing data. How has data work grown, what does this work look like, how is it changing, and what are its blindspots? It will consider the presence of biases, explore ethical views of using data, and more generally discuss occupational socializations to approaching data in a set way. Note that Week 9 provides a continuation of these ideas by studying how individuals

learn to work. Four of this week's readings provide close studies of these issues within the field of information, and a fifth (McAfee and Brynjolfsson) introduces broader social trends.

In discussing this week's readings, students should prepare notes on the author's main points and thesis. Students should critically reflect on some or all of the following questions: How does the reading deepen or broaden your insights? How does your personal experience confirm or refute what the author is saying? What did you agree with, disagree with, and why? What topics are not clear, or where is there insufficient (or too much) detail? What other questions or issues does the material raise but not address?

Instructors should structure the discussion around: (1) this week's readings, and (2) the students' recent interactions and experiences managing their own personal (digital) data. The discussion should emphasize the role of information workers as data workers. Students should come prepared to discuss ideas from the readings that most surprised them, contradicted their previous experience, and/or provided them with food for thought for their own projects.

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### LEARNING OBJECTIVES

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1. To understand the work of data production, curation, and analysis.
2. To understand how this work has grown and changed over time,
3. To identify and describe strengths, biases, and blind spots of these kinds of work.

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### ASSIGNED READINGS

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Carter, D., & Sholler, D. (2015). Data science on the ground: Hype, criticism, and everyday work. *Journal of the Association for Information Science and Technology*.

Duranti, L. (2015). Digital Records and Archives in the Commercial Cloud. In C.S. Yoo & J-F. Blanchette (Eds.), *Regulating the Cloud: Policy for Computing Infrastructure* (pp. 197-214), eds. Cambridge, MA: MIT Press, 2015.

Marchionini, G., Lee, C.A., Bowden, H., & Lesk, M. (2012). *Curating for Quality: Ensuring Data Quality to Enable New Science (NSF Workshop Final Report)*. Chapel Hill: UNC School of Information & Library Science.

McAfee, A., & Brynjolfsson, E. (2012). Big data: The management revolution. *Harvard Business Review*, 90(10), 60-68.



Vertesi, J., & Dourish, P. (2011). The value of data: Considering the context of production in data economies. In *Proceedings of the ACM 2011 conference on Computer supported cooperative work (CSCW '11)* (pp. 533-542).

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### SUPPLEMENTAL READINGS

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Teate, R. (2015, November 22). A challenge to data scientists. Retrieved from <http://www.becomingadatascientist.com/2015/11/22/a-challenge-to-data-scientists/>.

Barocas, S., Hood, S., & Ziewitz, M. (2013, March 29). Governing algorithms: A provocation piece. Retrieved from <http://governingalgorithms.org/resources/provocation-piece/>

Duranti, L. (1999). Meeting the challenge of contemporary records: Does it require a role change for the archivist? Retrieved from <http://www.archivists.org/governance/presidential/duranti-2.asp>.

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### EXAMPLES OF EXERCISES

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Exercise 1 – Personal data map: Ask students to review their browsing history and map out what data they have provided to which websites in the past day or two. From those maps, have students choose three sites that interest them most and investigate the sites' data policies. Do the sites or companies have formal, available policies? What are they? Do they give a clear idea of how data will be used? Is the company a member of any organizations with data codes of conduct (perhaps their key personnel are members)? Students could further investigate the sites' marketing materials and corporate reports; do these items give further ideas of how the site uses data it collects?

Exercise 2 – Grant project management: This exercise serves as a microcosm of investigating broader data work issues within such constraints as time, funding, and team membership. It should include (a) tips for how to manage the writing process for individual and collaborative proposals, (b) lessons about budgeting grant money for information work projects, and (c) an overview of some of the difficulties students should expect to encounter if their work involves getting grants. The exercise should generate awareness of the similarities and differences between the academic grant process and the industry grant process.

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## WEEK 4: DIGITAL ARTIFACTS

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This week of class will focus on how information artifacts are central to the work and work process of organizations. In particular the session will explore how people use digital and non-digital tools, artifacts, and technologies in organizational settings to structure, coordinate, and create meaning in their everyday activities.

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## LEARNING OBJECTIVES

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1. To understand the relation of the digital and the material. What theoretical perspectives come into play in the study of information artifacts in everyday work? What are the particular affordances of physical and digital artifacts? Do the former supplant the latter, supplement them, or extend them? Do digital artifacts require new skills or ways of thinking as compared to physical ones?
2. To understand information artifacts at work. What role do artifacts play in coordinating and aligning cooperative work? How do digital and physical artifacts operate as boundary objects? When working, perhaps across distance, with others, and when collaborating with them, how do people create, share, and store digital artifacts? How do they maintain control when versioning, permit and limit change, and so on?
3. To consider learning from information artifacts. When sharing work artifacts back and forth with colleagues, how does one come to grasp the implicit knowledge stored in the artifacts? How do artifacts play a role in helping people come to shared understandings? How does one tease from artifacts an understanding of others' intentions, perspectives, needs, and so on?

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## ASSIGNED READINGS

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Heath, C., & Luff, P. (2000). *Technology in action*. Cambridge, U.K: Cambridge University Press. Chapters feature case studies of adoption and implementation of information systems in different industries / workplaces.

Leonardi, P. M., & Bailey, D. E. (2008, June 1). Transformational technologies and the creation of new work practices: Making implicit knowledge explicit in task-based offshoring. *MIS Quarterly*, 32(2), 411-436.

Meyer, S. R., Pierce, C. S., Kou, Y., Nardi, B. A., Leonardi, P. M., & Bailey, D. E., (2015). Offshoring digital work, but not physical output: Differential access to task objects and coordination in globally distributed automotive engineering and graphic design work. In *Proceedings of the Annual Hawaii International Conference on System Sciences* (pp. 1758-1767). Contrasts distributed workers' access and experience of digital objects and physical objects

Odom, W., Sellen, A., Harper, R., & Thereska, E. (2012, May). Lost in translation: understanding the possession of digital things in the cloud. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 781-790). Reports on qualitative research on personal attitudes toward physical, local, and cloud objects.

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## SUPPLEMENTAL READINGS

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Harper, R., Lindley, S., Thereska, E., Banks, R., Gosset, P., Smyth, G., Odom, W., & Whitworth, E. (2013). What is a file? In *Proceedings of the 2013 conference on Computer supported cooperative work* (pp. 1125-1136). Discusses the metaphor of “file” for digital objects and its role as a boundary object in computing.

Lee, C. (January 01, 2007). Boundary negotiating artifacts: Unbinding the routine of boundary objects and embracing chaos in collaborative work. *Computer Supported Cooperative Work*, 16(3), 307-339.

Leonardi, P. M. (2010, June 7). Digital materiality? How artifacts without matter, matter. *First Monday*, 15(6). Introduces the concept of “digital materiality” and how digital objects can be considered as having physical properties and as being significant.

Schmidt, K., & Wagner, I. (2004). Ordering systems: Coordinative practices and artifacts in architectural design and planning. *Computer Supported Cooperative Work (CSCW)*, 13(5-6), 349-408.

Gruning, J., Bullard, J., & Ocepek, M. (2015). Medium, access, and obsolescence: What kinds of objects are lasting objects? In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 3433-3442).

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## EXAMPLES OF EXERCISES

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### Exercise 1 – Technology-focused instantiation example: The Cloud

- Introduce students to the development and deployment of “cloud” technologies
- Through class discussion, informed by the readings, generate some characteristics that differentiate files on the cloud from local files and paper documents
  - Highlight a few as guiding questions for the group exercise that comes next
- Have students split into groups to research the specifications of personal and business cloud services (e.g. Dropbox, Google Drive, Box) and report back
  - Where are files stored?
  - What guarantees are there of security?
  - What guarantees are there of data loss?
  - Who can access and edit files?
  - What traces of user/file history are recorded?
  - How do users manage versioning?

- What is this company's history of incidents with security, data loss, or law enforcement?
- Recap with reporting, class discussion, and identifying or filling in information on difficult to locate features
- Have students each write one-minute papers connecting some feature of cloud technology to a theme from an earlier class session (e.g. law, labor management) OR how objects in the Cloud change a workplace or industry of their choice

#### Exercise 2 – Profession-focused instantiation example

- Provide students with a list of professions and have them brainstorm ways in which the transition to digital objects has changed work and work practice; share and compare to known studies.
- One example to use is that of healthcare. Students can think about the changes occurring in the areas of productivity, automation and task efficiency, remote presence and monitoring, privacy and security, etc. A good resource for identifying literature in this area is Fitzpatrick, G., & Ellingsen, G. (2013). A review of 25 years of CSCW research in healthcare: contributions, challenges and future agendas. *Computer Supported Cooperative Work (CSCW)*, 22(4-6), 609-665.

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### WEEK 5: LAW AND POLICY

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This week of class will provide an introduction to the ways government actions influence information-centered industries through trade regulation, education policy, labor and contract law, and intellectual property rights. It will begin by examining issues around IT offshoring and outsourcing, including companies' motivations for engaging in these practices and the frequently contradictory responses of politicians and economists. Continuing in this vein, it will draw comparisons between the education policies of the United States, India, China, and European Union aimed at maximizing workers' competitiveness in the global market. It will include a discussion of labor law and employment law as they relate to changing patterns of work in the U.S., focusing in particular on companies' recent shift toward hiring independent contractors rather than traditional employees. Next, this week will consider the intellectual property regulations that form the foundation of markets for information goods, weighing a range of factors that will shape future changes in IP law. Finally, this week's suggested reading list contains several studies on federal funding for basic research in the U.S., which has declined significantly since the 1960s despite paving the way for numerous multibillion-dollar IT industries.

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### LEARNING OBJECTIVES

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1. To identify whose interests are reflected in national and international policies governing information work and evaluate the consequences for other parties concerned.
2. To critically evaluate the efficacy/value of government policies related to information work and suggest potential improvements and alternatives.
3. To consider the potential results of a proposed change in policy and predict a range of likely outcomes.

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### ASSIGNED READINGS

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- Aspray, W. (2010). IT offshoring and American labor. *American Behavioral Scientist*, 53(7), 962-982. An overview of IT employment offshoring in recent decades, factors motivating the trend, and its place in debates among politicians and economists. Potential policy responses are outlined in areas including education, trade regulation, work visas, and federal research support.
- Aggarwal, A., Allen, F., Andriole, S., Arora, A., & Aspray, W., Balachandirane, G., ... Zweben, S. (2006). Chapter 7: Education. In W. Aspray, F. Mayadas, & M.Y. Vardi (Eds.), *Globalization and Offshoring of Software: A Report of the ACM Job Migration Task Force* (pp. 213-253). Association for Computing Machinery. An overview of various countries' efforts to educate workers to compete in the global IT labor market. Presents descriptions of education structures in India, China, the US, and Europe and their recent changes.
- Stone, K. V. (2009). A labor law for the digital era. *Employee Responsibilities and Rights Journal*, 21(2), 145-161. Argues that current labor laws and union practices, developed around the time of the New Deal, are ill-suited for today's technology workforce. In contrast to the heyday of scientific management, today's workers are forced to change jobs frequently while employers cultivate their broad knowledge and creativity. Two options are presented for the future: Either workers' security and bargaining rights will continue to atrophy or labor policy can be rewritten in the legislature.
- Drahos, P. (2005). Intellectual property rights in the knowledge economy. In D. Rooney, G. Hearn, & A. Ninan (Eds.), *Handbook on the Knowledge Economy* (pp. 139-51). Cheltenham, UK ; Northampton, MA: Edward Elgar. Describes types of IPR protections and their role in knowledge economies, along with justifications and brief historical context. Ends with discussion of potential for rent-seeking abuses and the need to negotiate the degree of IPR protections in emerging knowledge economies.

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### SUPPLEMENTAL READINGS

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#### **Offshoring and Outsourcing**

- Parthasarathy, B. (2013). The changing character of Indian offshore ICT services provision. In A. D. Bardhan, D. M. Jaffe, & C. A. Kroll (Eds.), *The Oxford Handbook of Offshoring and Global Employment*. Oxford Handbooks. Oxford: Oxford University Press. Examines a set of technical and political factors between the 1980s and 2010s that have led India to become the world's largest exporter of IT services. Includes case studies on the tech companies Infosys and Cisco Systems.
- Barry, F., & Bergin., A. (2013). Offshoring, inward investment and export performance in Ireland. In A. D. Bardhan, D. M. Jaffe, & C. A. Kroll (Eds.), *The Oxford Handbook of Offshoring and Global Employment*. Oxford Handbooks. Oxford: Oxford University Press. Discusses history of post-WWII foreign direct investment in Ireland, tracing broad shift from low-skill manufacturing and service jobs to high-skill knowledge work. Ireland's corporate tax regime and other policy factors are given some credit for these trends. Includes case studies on IT industry, financial services, pharmaceuticals, and medical devices.

### **Labor Legislation**

- Kesan, J. P., & Hayes, C. M. (2013). The law and policy of non-compete clauses in the United States and their implications. In M. Pittard, A. L. Monotti, J. Duns (Eds.), *Business Innovation and the Law: Perspectives from Intellectual Property, Labour, Competition and Corporate Law* (pp. 381-404). Cheltenham, UK; Northampton, MA: Edward Elgar. Examines the recent proliferation of non-complete clauses in employee contracts intended to protect proprietary corporate information. Outlines regional variations in contract law in the United States and the consequent challenges to enforcing such provisions.

### **Intellectual Property**

- Helfer, L. R. (2004). Regime shifting: the TRIPs agreement and new dynamics of international intellectual property lawmaking. *Yale Journal of International Law*, 29(1), 1-89. Explores the scope and effects of the 1994 Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPS) and its interactions with various other multilateral and bilateral agreements. In this complex legal landscape, apparently settled standards are continuously renegotiated as states and NGOs appeal to the regimes they perceive as most favorable to their interests.

### **Federal Research Funding**

- Block, F., & Keller, M. R. (2009). Where do innovations come from? Transformations in the US economy, 1970–2006. *Socio-Economic Review*, 7(3), 459-483. An empirical study of the “triple helix of intertwined efforts by government, universities and corporations to produce more rapid innovation,” examining products that have earned industry awards for innovation in recent decades and the sources of research that made them possible. The authors find declining contributions to innovation by large corporations, while interorganizational collaborations, start-ups, and public

sector institutions have played greater roles. The demonstrated importance of government-funded R&D is presented in contrast to the recent rise of free-market ideology in the tech industry.

Singer, P. (2014, February). Federally supported innovations: 22 examples of major technology advances that stem from federal research support.” *Information Technology and Innovation Foundation*. A series of case studies on instances in which commercial enterprise has benefited from government-funded research, including Google’s search engine, smartphone technologies, GPS, civilian aviation, and various medical and agricultural technologies.

National Research Council. (2012). *Continuing Innovation in Information Technology*. Washington, DC: The National Academies Press. An overview of public funding of basic research in information technology and its long-term economic benefits. Includes an updated version of the “tire tracks” diagram displaying government-funded R&D’s influence on the growth of various IT fields from the 1960s the present.

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## EXAMPLES OF EXERCISES

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Exercise 1: Choose a statute at the state or federal level that directly affects some form of information work. Summarize the law as written, then discuss its motivating purpose and potential effects on workers and/or industry.

Statutes for the US and Texas:

- <http://uscode.house.gov>
- <http://www.statutes.legis.state.tx.us>

Exercise 2: Choose a proposed policy change discussed recently in the media, such as a draft bill or pending legal decision at the federal level. Referring to past examples, describe several potential outcomes, and predict which result appears most likely.

## WEEK 6: EFFECTS OF INFORMATION TECHNOLOGY IN THE WORKPLACE

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This week of class will explore the effects of information technologies (IT) on information work, information workers, and organizations. This week’s readings reflect ideas from scholars of information systems, organizations, and sociotechnical studies. Some readings demonstrate how IT can be a useful tool for promoting transparency in organizational processes, increasing control over these processes, and facilitating communication and coordination among organizations, groups, and workers. Other readings explain that although the promise of IT for revolutionizing work is well-documented, so too are the challenges associated with getting workers to use the technology in standardized, meaningful ways.

The class discussion should address how workers come to adopt, adapt, resist, and incorporate new technologies into their work practices. The discussion should aim to build an understanding that new technologies are not universal solutions to organizational problems; rather, organizations introduce IT to individuals with diverse backgrounds, experiences, and technology comfort levels and deploy IT into complex social contexts. The exercises illustrate some of the unintended or unexpected effects of IT intervention. Taken together, the readings, discussion, and exercises aim to provide a first step in developing students' abilities to manage decisions about which technology a department or organization should adopt, how to implement the IT, and how to govern use.

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### LEARNING OBJECTIVES

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1. To gain understanding into why organizations implement new IT.
2. To explore how workers respond when a new technology is introduced into the workplace.
3. To learn to evaluate the individual, group, and organizational outcomes of workers' responses.

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### ASSIGNED READINGS

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Barley, S. R., & Kunda, G. (2001). Bringing work back in. *Organization Science*, 12(1), 76-95.

Luff, P., Hindmarsh, J., & Heath, C. (2000). *Workplace studies: Recovering work practice and informing system design*. Cambridge, UK: Cambridge University Press. Selected readings.

Orlikowski, W. J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science*, 3(3), 398-427.

Pinch, T. J., & Oudshoorn, N. (Eds.). (2005). *How users matter: The co-construction of users and technologies*. Cambridge, MA: MIT Press. Selected readings.

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### SUPPLEMENTAL READINGS

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Bailey, D. E., Leonardi, P. M., & Barley, S. R. (2012). The lure of the virtual. *Organization Science*, 23(5), 1485-1504.

Barley, S. R. (1986). Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. *Administrative Science Quarterly*, 31(1), 78-108.

Cooper, R. B., & Zmud, R. W. (1990). Information technology implementation research: A technological diffusion approach. *Management Science*, 36(2), 123-139.



- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340.
- Edmondson, A. C., Bohmer, R. M., & Pisano, G. P. (2001). Disrupted routines: Team learning and new technology implementation in hospitals. *Administrative Science Quarterly*, 46(4), 685-716.
- Ginzberg, M. J. (1981). Early diagnosis of MIS implementation failure: Promising results and unanswered questions. *Management Science*, 27(4), 459-478.
- Harper, G. R., & Utley, D. R. (2001). Organizational culture and successful information technology implementation. *Engineering Management Journal*, 13(2), 11-15.
- Hong, K. K., & Kim, Y. G. (2002). The critical success factors for ERP implementation: An organizational fit perspective. *Information & Management*, 40(1), 25-40.
- Jaspersen, J. S., Carter, P. E., & Zmud, R. W. (2005). A comprehensive conceptualization of post-adoptive behaviors associated with information technology enabled work systems. *MIS Quarterly*, 29(3), 525-557.
- Lapointe, L., & Rivard, S. (2005). A multilevel model of resistance to information technology implementation. *MIS Quarterly*, 3(1), 461-491.
- Leonard-Barton, D. (1988). Implementation as mutual adaptation of technology and organization. *Research Policy*, 17(5), 251-267.
- Rai, A., Patnayakuni, R., & Patnayakuni, N. (1997). Technology investment and business performance. *Communications of the ACM*, 40(7), 89-97.
- Robey, D., Boudreau, M. C., & Rose, G. M. (2000). Information technology and organizational learning: A review and assessment of research. *Accounting, Management and Information Technologies*, 10(2), 125-155.

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## EXAMPLES OF EXERCISES

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Exercise 1: This exercise provides hands-on experience to help grasp how workers learn from digital artifacts. The guiding question throughout this exercise will be based on the question, “When sharing work artifacts back and forth with colleagues, how does one come to grasp the implicit knowledge stored in the artifacts? How does one tease from them an understanding of others’ intentions, perspectives, needs, and so on?” For about 45 minutes, the class should break into groups (roughly five students per group) and begin creating a digital artifact meant to instruct another group in developing an academic term paper. Using only the set of free Google Drive products (Google Docs, Google Sheets, Google Pictures, etc.), ask each group to put together an “instruction manual” for writing a term paper (or a similarly “simple” task). Then reconvene and assess each manual as a class. Pick out similarities and differences between these manuals, focusing on a few specific areas:

- a. How might disciplinary differences influence the construction of digital artifacts? In other words, are there differences in the tools humanities students and social or natural science students used to create and present their instructions?
- b. How can each instruction manual be revised to better speak to a specific audience? How can each be revised to speak to a more general audience?
- c. Are there differences in intention in the instruction manuals?

Exercise 2: In this exercise, break the class into groups and have each group develop a short research-supported training manual for the implementation of a new technology in an information organization. Ideally, provide the students with a few choices for technologies to accomplish a given task. For example, the instructor might tell them that their organization is deciding whether to adopt Microsoft Word, Google Docs, or Libre Office for word processing. The instructor might then give them some characteristics of the organization: how much of the work is individual vs. group work, the technology experience level of the workers, and the types of computing technologies workers commonly use (phones, laptops, desktops, etc.), among other things. The groups should then develop an argument for which technology to choose and provide five to ten “best practices” for implementing the technology and training workers.

## WEEK 7: SPACE AND TIME ALTERED: THE CASE OF VIRTUAL TEAMS

This week of class will address virtual teams and the challenges that come from working across space and time. This week will focus on how people work together from afar, and the technology that allows them to do so. Among the topics to be discussed are virtual work and the changing face of work as technology that allows individuals to do work remotely. This week centers on any work that is done via technology in an environment that is not face-to-face, including work that is done remotely from a home office, and from co-located spaces (work spaces that allow individuals to work outside of the home in a traditional office environment). Discussion should occur around the changes that students have seen with burgeoning technology that aims to decrease physical distance and mediated communication between work teams.

This session will also help to address the challenges that usually come up when talking about virtual work, such as concerns about communication and stress in such environments. An exploration of intersectionality of gender, race, class, and culture will also be addressed.

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### LEARNING OBJECTIVES

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1. To help students develop and explain an informed opinion on whether we can or will ever be able to replicate face-to-face communication with virtual teams, as well as what we can do better.

2. To identify challenges with the intersectionality of race, class, gender with space and time within virtual teams.
3. To understand the practical and underlying issues of creating, managing, and working with virtual work within teams.

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#### ASSIGNED READINGS

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Hollan, J., & Stornetta, S. (1992). Beyond being there. *Proceedings of ACM CHI'92 Conference on Human Factors in Computing Systems*, 119–125.

Lind, M. R. (1999). The gender impact of temporary virtual work groups. *Professional Communication, IEEE Transactions on*, 42(4), 276-285.

Jarvenpaa, S. L., & Leidner, D. E. (1998). Communication and trust in global virtual teams. *Journal of Computer-Mediated Communication*, 3(4).

Cramton, C. D. (2001). The mutual knowledge problem and its consequences for dispersed collaboration. *Organization Science*, 12(3), 346-371.

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#### SUPPLEMENTAL READINGS

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Gibson, C. B., & Cohen, S. G. (2003). *Virtual Teams that Work*. San Francisco, CA: JosseyBass.

Leonardi, P. M., & Bailey, D. E. (2008). Transformational technologies and the creation of new work practices: Making implicit knowledge explicit in task-based offshoring. *MIS quarterly*, 32(2), 411-436.

Kraut, R. E. (2003). Applying social psychological theory to the problems of group work. In J. M. Carroll (Ed.), *HCI Models, Theories and Frameworks: Toward a Multidisciplinary Science* (pp. 325-356). San Francisco, CA: Morgan Kauffman.

Huws, U. (2009). The making of a cybertariat? Virtual work in a real world. *Socialist Register*, 37(37).

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#### EXAMPLES OF EXERCISES

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Exercise 1: Ask for volunteers to be members of a virtual team, some students will be considered the remote group (Group A), and the rest of the members will be the home team (Group B). Ask Group A to move to a different room where the rest of the class can't see them.

Assign some members from both groups to roles of which only they will be aware. These roles could be

1. A person who does not say his or her name before talking in a meeting, thus causing confusion for the virtual team,
2. A person who is sitting too far away from the polycom and cannot be heard well,
3. A person who is texting the whole time and not paying attention because not being there might not make him or her feel as accountable,
4. A person who comes in later or leaves early without telling the other members that he or she is present or is planning on being absent.

Run a 5-minute meeting with the groups, with everyone playing his or her role. At the end of the meeting, ask the groups to come together and debrief on what worked, what did not work, and what the team members could have done to make it work better.

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## WEEK 8: LABOR

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This week of class will look at information work in the context of late-20<sup>th</sup> and early-21<sup>st</sup> century labor relations. In focusing on topics such as outsourcing and freelancing, it will overlap with other weeks dealing with occupational trends and space and time; however, the goal of this week is to place these phenomena in a broader economic and political context. Globalization, deregulation and individuals' desire for something other than the Fordist standard employment relation are described across the readings for this module as prompting labor that is informal, flexible, and precarious. Kalleberg (2011) provides an overview of recent labor history, and Arnold and Bongiovi (2013) give a thorough review of arguments around the resulting characteristics of work. Fish and Srinivasan (2012) give ethnographic accounts of information work that are contextualized in relation to the arguments about labor made in this week's other readings. Supplemental readings allow for the exploration of specific topics such as unions (Rodino-Colocino (2008)), automation (Autor (2015) and Vardi (2015)) and casual labor (Raval and Dourish (2016)).

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### LEARNING OBJECTIVES

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1. To gain a basic understanding of the history of 20<sup>th</sup> and 21<sup>st</sup> century labor relations.
2. To understand contemporary labor issues such as outsourcing and freelancing.
3. To explore how these topics intersect with information work.

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### ASSIGNED READINGS

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Arnold, D., & Bongiovi, J. R. (2013). Precarious, informalizing, and flexible work: Transforming concepts and understandings. *American Behavioral Scientist*, 57(3), 289–308.

Fish, A., & Srinivasan, R. (2012). Digital labor is the new killer app. *New Media & Society*, 14(1), 137–152.

Kalleberg, A. L. (2011). Job Quality in the United States. In *Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States, 1970s-2000s* (pp. 1–18). New York: Russell Sage Foundation.

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## SUPPLEMENTAL READINGS

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### **History of Labor Relations**

Kalleberg, A. L. (2011). Economic transformations and the decline of institutional protections. In *Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States, 1970s-2000s* (pp. 21–39). New York: Russell Sage Foundation.

Ross, A. (2009). Introduction. In *Nice Work If You Can Get It: Life and Labor in Precarious Times* (pp. 1–11). New York: NYU Press.

### **Contemporary Topics**

Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives*, 29(3), 3–30.

Elcioglu, E. F. (2010). Producing precarity: The temporary staffing agency in the labor market. *Qualitative Sociology*, 33(2), 117–136.

Raval, N., & Dourish, P. (2016). Standing out from the crowd: Emotional labor, body labor, and temporal labor in ridesharing. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 97–107). New York: ACM.

Vardi, M. Y. (2015). Is information technology destroying the middle class? *Communication of the ACM*, 58(2), 5. [Response to Author (2015)]

### **Specific to Information Work**

Fuchs, C. (2010). Labor in informational capitalism and on the Internet. *The Information Society*, 26(3), 179–196.

Kapur, J. (2008). “New” economy/old labor: creativity, flatness, and other neo-liberal myths. In C. McKercher & V. Mosco (Eds.), *Knowledge Workers in the Information Society* (pp. 147–162). Lanham, MD: Lexington Books.

Rodino-Colocino, M. (2008). High-tech workers of the world, unionize!: A case study of WashTech’s “new model of unionism.” In C. McKercher & V. Mosco (Eds.), *Knowledge Workers in the Information Society* (pp. 209–227). Lanham, MD: Lexington Books.

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## EAMPLES OF EXERCISES

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Exercise 1: For this exercise, each student will interview two people about their work history. Half the students will identify and interview individuals over the age of 60; the other half will interview individuals in their 30s. Ask students to include descriptions of positions held, what work was like, what compensation and benefits were included, and what individuals thought about work. In class, have students discuss their collected labor histories in two groups (one for each age group interviewed) and then bring the class together to discuss any patterns that emerge. What characteristics tend to differentiate age groups? What consistencies are found between groups? Discuss in terms of the week's readings on work quality and labor relations.

Exercise 2: Have students research job opportunities in a field of interest. Their research should include two phases: a local search and a second search in which location is not a factor. For each phase, students should focus on wages, terms of contracts and working conditions. In class, have students form groups related to their fields of interest to compare their findings. Then, as a class, discuss differences and similarities across fields.

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## WEEK 9: EDUCATION AND TRAINING

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This week of class will explore how education and training for many professional workers has changed over the past several decades as work has increasingly become informed (Zuboff, 1988); in particular, this week's class will explore changes in how information professionals are educated. It will also explore how changes in skill and knowledge requirements for workers have occasioned changes in the types and forms of education and training available for people interested in various careers. The exploration is grounded in a set of white-collar occupations, which beyond information professionals includes doctors, lawyers, engineers, and teachers. For example, it will consider how robotic technologies and digital record-keeping are altering what doctors need to know, how electronic search and document discovery are transforming the education of lawyers, how simulation technologies change how engineers are taught and what they learn, and how learning analytics are transforming the curricula of education schools. This week will also examine blue-collar occupations through exploring occupations such as auto mechanics, repair technicians, and computer technicians, with similar attention to how changes in work elicit changes in the how these workers learn to do their jobs. These explorations will underscore shifts in education and training that include a move toward higher education, especially college education, a shift from physical to analytical skills acquisition, and a greater need for students to gain competencies and literacies in abstract thinking, computer use; data collection, management, and storage; information search, presentation and interpretation; mathematics, computation, and algorithmic logic, and software applications and hardware information systems. Included is an investigation into the site of learning, with attention to the rise in boot camps, training institutes, online and computer-based learning, as well as changes in the curriculum of education institutions

that include community colleges, trade school programs, 2-year and 4-year degree-granting institutions, and advanced degree programs.

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### LEARNING OBJECTIVES

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1. To consider how changes in work have prompted changes in education and training for a wide swath of the workforce
2. To gain an understanding of how computers play an increasing role not only in work, but also in preparation for work.

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### ASSIGNED READINGS

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Brown, J. S. (2000). Growing up: digital: how the web changes work, education, and the ways people learn. *Change: The Magazine of Higher Learning*, 32(2), 11-20.

Balamuralithara, B., & Woods, P. C. (2009). Virtual laboratories in engineering education: The simulation lab and remote lab. *Computer Applications in Engineering Education*, 17(1), 108-118.

Devitt, N., & Murphy, J. (2004). A survey of the information management and technology training needs of doctors in an acute NHS trust in the United Kingdom. *Health Information & Libraries Journal*, 21(3), 164-172.

Pope, M., Hare, D., & Howardy, E. (2002). Technology integration: Closing the gap between what preservice teachers are taught to do and what they can do. *Journal of Technology and Teacher Education*, 10(2), 191-204.

Sherwin, R. K., Feigenson, N., & Spiesel, C. (2006). Law in the digital age: How visual communication technologies are transforming the practice, theory, and teaching of law. *Boston University Journal of Science & Technology Law*, 12(2).

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### SUPPLEMENTAL READINGS

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Seely, B. E. (1999). The other re-engineering of engineering education, 1900-1965. *Journal of Engineering Education*, 88(3), 285.

Borg, K. L. (2007). *Auto mechanics: Technology and expertise in twentieth-century America*. Baltimore, MD: Johns Hopkins University Press.

Germain, C. M. (2007). *Legal Information Management in a Global and Digital Age: Revolution and Tradition*. Rochester, NY: Social Science Research Network.

Reiner, B. I., Siegel, E. L., & Siddiqui, K. (2003). Evolution of the digital revolution: a radiologist perspective. *Journal of Digital Imaging*, 16(4), 324-330.

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### EXAMPLES OF EXERCISES

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Exercise 1 – Surveying the Field: Have each student identify a University’s MOOC program as well as a non-University based online training programs such as Coursera or Codeacademy and note the types of classes that have been offered by these entities over the last five years. Work with students in class to develop a standard form of attributes to consider and collect in order to accumulate a wide range data that can be compared across different entities. Use these students’ aggregated findings to generate a discussion about upskilling in job training and to compare with the findings in the next activity, Building Evidence from Course Catalogs, to understand how training is changing in and outside of more traditional educational environments.

Exercise 2 – Building Evidence from Course Catalogs: Have students gather the course catalogs from their school of information or library science, ideally from the school’s origin to the present. With students working in teams, have students code each offered course to reflect content (e.g., reference librarianship, archives, databases, computer programming). With the results of this coding, plot the number of technical courses (e.g., databases, computer programming) as a percent of total offered courses over time. Also note in the coding process the first mention of digital or technical content within course descriptions. Use the students’ findings to generate a discussion of how the education of information professionals has changed in the program over time.

Exercise 3 – Interview Workers: Have each student identify a unique occupation and then interview someone employed in that occupation. The interview should focus on what role computers, technical topics, abstract thinking, and the like played in that education, and how well the interviewee thinks that education prepared him or her for the informed aspects of his or her work. Work with students in class to develop a standard set of questions that all students might use, and instruct them how to deviate from that set to explore the particularities of work with each interviewee.

## WEEK 10: INFORMATION WORK FOR AND AGAINST THE STATE, INDUSTRY, AND INDIVIDUALS

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This week of class will focus on the relationship between information work and the state, industry, and private individuals. It will focus on basic definitions of intelligence work and its ability to both defend and attack nation states and commercial organizations.

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### LEARNING OBJECTIVES

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1. To understand nature of information work that is carried out to defend and attack both nation states and commercial organizations (e.g., criminal, military, rogue/terror, intelligence).
2. To understand approaches and limits to learning about intelligence work, with a focus on the following concepts:



- Intelligence work: overt or covert activities to acquire, produce, and analyze information not publicly available which is used for military, government, or corporate decision making or policy development (See Jin, T., & Bouthillier, F. (2012). The integration of intelligence analysis into LIS education. *Journal of Education for Library and Information Science*, 53(2), 130–148.)
- Espionage: historic/contemporary/future examples of how nations have acquired and used information through espionage and spying on their own citizens – and how nations have defended against it;
- Terror and anti-terror: historic/contemporary/future examples of information work with the goal of creating fear and anxiety among large groups of people, and defenses such as hacktivism.
- Military/War: historic/contemporary/future examples of information work in support of organized war between nations.
- Cybercrime and defense: contemporary/future examples of information work intended to defraud, including identity theft, theft of organizational information (e.g., credit card numbers), etc.

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#### ASSIGNED READINGS

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- Albrechtsen, E., & Hovden, J. (2009). The information security digital divide between information security managers and users. *Computers & Security*, 28(6), 476–490.
- Borchers, C. (2015, November 28). How will “Anonymous” wage war on the Islamic State? One of its own tells us. *The Washington Post*. Retrieved from <https://www.washingtonpost.com/news/the-fix/wp/2015/11/28/how-will-anonymous-wage-war-on-the-islamic-state-one-of-its-own-tells-us/>
- Williams, R. V., & Lipetz, B.-A. (2005). *Covert and overt: Recollecting and connecting intelligence service and information science*. Medford, NJ: Information Today, Inc. The instructor should choose chapters in this book that are consistent with her/his interests, such as some of the historical accounts for color, Brunt’s discussion of indexing or Burke’s discussion of the role of intelligence agencies, librarians, and information scientists, or Hellner’s discussion of evidence and inference.
- Wu, Y. (2013). Strengthening intelligence education with information-processing and knowledge-organization competencies. *Journal of Strategic Security*, 6(3), 10-24.

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#### SUPPLEMENTAL READINGS

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Hampson, N. (2012). Hacktivism, anonymous & a new breed of protest in a networked world. *Boston College International and Comparative Law Review*, 35(6), 511-542.

Singer, P. W., & Friedman, A. (2014). *Cybersecurity and Cyberwar: What Everyone Needs to Know*. Oxford: Oxford University Press

Stringhini, G., Hohlfeld, O., Kruegel, C., & Vigna, G. (2014). The harvester, the botmaster, and the spammer: On the relations between the different actors in the spam landscape. In *Proceedings of the 9th ACM Symposium on Information, Computer and Communications Security* (pp. 353–364). New York: ACM.

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### EXAMPLES OF EXERCISES

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Exercise: Research about how intelligence workers work is scant: most scholarship is historical, and only available after proscriptions to discuss wartime work are lifted. Students should come to class prepared to discuss the sources of research on intelligence work, based on their searches in scholarly literature databases. They are likely to find that people who do this kind of research are members of government agencies or corporations and unable to publish their work.

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### ABOUT THE AUTHORS

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In 2016, the Information Work Research Group at The University of Texas at Austin's School of Information created this model syllabus with lesson plan for a course on information work. Group members include faculty members William Aspray, Diane Bailey, Lecia Barker, Tanya E. Clement, James Howison, and Ciaran Trace and doctoral students Sarah Buchanan, Julia Bullard, Daniel Carter, Nicholas Gottschlich, Nida Kazim, Stephen McLaughlin, Melissa Ocepek, and Dan Sholler.

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